

2550 Garcia Avenue, MS UMTV29-Lobby  
Mountain View, CA 94043-1100  
415 366-2600



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Federal Communications Commission  
Office of Secretary

December 4, 1996

The Secretary William Caton  
Federal Communications Commission  
1919 M Street, N.W.  
Room 222  
Washington, D.C. 20554

RE:GN DOCKET NUMBER 96-228

DOCKET FILE COPY ORIGINAL

Dear Mr. Secretary:

These are Sun Microsystems' comments in response to GN Docket number 96-228 concerning the "General Wireless" band auction plan for allocation and use of these frequencies.

1. Sun Microsystems supports the market based bidding approach for sale of the frequencies. Based upon the recent PCS auction, allowing the market to determine the value of the spectrum appears to be the best method to ensure fair pricing.

At the same time, we would not like to see any one service use, as differentiated from service owner, gain the entire spectrum. Diversity in the allocation must be mandated, it is the very nature of technologic expansion that non single use technologies end up being exploited to new ends. The same model should be held to for this spectrum. For example, it would be an error to allow one bidder to gain the entire spectrum and subsequently sub-lease it to a single service such as voice cordless phones.

2. To serve the widest range of uses which would benefit the citizens of the United States in the next century, we propose the following allocation plan based upon "uses":

a) Divide the country in to 5 regions based upon population. Sale of the spectrum would cover each region, by band.

b) Any one bidder for more than one region must agree to support twice the number of uses multiplied by their total regional count, for example an owner of two regions must support 4 uses.

c) A use to be defined as a non interfering service, fixed or mobile, which offers a substantially different mechanism for accessing and delivering data.

d) Each buyer may only deploy a service which achieves greater than 5 bits/Hz data rate. By set-

ring the goal this high, the Commission will force the stimulation and creation of new technologies at a rapid pace.

e) Higher revenues for the Government may be realized by the use and sale of overlay networks. Each bidder should be made aware that their region could be a virtual region, in that another bidder using advanced modulation and coding techniques could offer similar services in the same area and band by use of a "virtual network" approach. To extend this analogy, the Commission should consider offering 5 regions as being vertical regions, not horizontal or geographically based.

3. We believe that the only definition of technologies which would fall under "accepted use" policies currently in effect by the Commission would be that no analog transmissions be allowed, only digital, for any service or allocation.

4. Digital Data will predominate in the next century. Even with the current technology, congestion and overloading of land line based systems for data networking are frequent and growing worse by the day. The Commission should encourage the use of this spectrum as "Internet Bypass" service, in order to create immediate market demand.

5. Each bidder should be required to demonstrate an application of their use, one which appeals to the widest consumer base, before deployment. A novel approach, in that the delay in constructing massive infrastructure such as that used in the AMPS cellular service would again open the door to alternate competition, such as by satellite and fiber. By creating demand, each bidder would then be able to exploit market based opportunities for revenue and Research and Development funding. In short, we see this band creating a new experimentation area, one which must be not only permitted but encouraged by regulation.

6. Each offering of any service by any bidder should be Tiered, in order to allow the largest possible group of citizens to afford its benefits. For example, a Data Service provider must be required to offer T1 (1.544Mb/s) service, 256Kb/s, 128Kb/s and 56Kb/s services at proportionately lower rates.

7. Band Plan. For efficient use and future expansion, we propose the following bandplan:

**2105 - 2120 MHz: Downlink Band**

2 x 1 Mhz segments for control channels, low bit rate telemetry, alarms, monitoring etc.

2 x 5 MHz High Speed channels, which may be aggregated in to one 10MHz channel as needed by the owner. Dynamic aggregation permitted.

2 x 1 MHz for "Adjudicating", or unidirectional services only.

1 MHz for experimentation, unregulated in any way.

**2145 - 2160 MHz Same as above, used for Uplink**

**Spatial Multiplexing** - require high gain directional antenna systems, as with the challenging Bits/Hz target above, establish a superior target of 2-3 degree beamwidth for high power use, any Omnidirectional use requires low power and 18-25dB gain antennas. Encourage the "establishment of ad hoc cellular type systems.

**Modulation** - no restrictions except for digital services only.

**Overlays** - permit orthogonal coding and modulation schemes to permit one network to be "overlaid" upon another, i.e. the regions may be overlapping for each bidder.

This band plan would permit high speed, low speed, telemetry, coordinated and un-coordinated base and mobile, fixed and ad-hoc usage services.

Thank you for seeking our input in this decision making process, please let me know if we may be of further assistance in any way.

Sincerely,



Dr. Eric Schmidt  
Chief Technical Officer  
Sun Microsystems, Inc.

cc: Mr. Robert Pepper